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CASE REPORT

Aesthetic replacement of an anterior tooth using the natural tooth as a pontic; an innovative technique

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KEYWORDS

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Abstract This article presents a novel technique for replacing an anterior tooth. A new modification to the clinical technique of direct fabrication of a resin-bonded bridge was employed, in which the patient's natural tooth was used as a pontic. Treatment with this modification led to overall improved aesthetics and reduced treatment cost. The natural tooth pontic was stabilized in the extraction socket with a resin-wire splint as a provisional restoration to maintain the gingival architecture while the permanent bridge was being constructed.

Introduction

A goal of modern dentistry is the placement of aesthetically pleasing restorative materials. Like other branches of dentistry, conservative aesthetic dentistry involves many treatment modalities demanding tooth preservation by various means. Whenever a missing tooth structure is to be replaced, the dentist should consider numerous factors, including natural tooth preservation, minimal intervention, aesthetics, and cost.

Certain situations require the dentist to remove an anterior tooth. These conditions may include dental trauma, advanced periodontal disease, extensive root resorption, and endodontic failure. Whenever an anterior tooth is lost, the clinician should provide an immediate replacement to avoid aesthetic, masticatory, and phonetic difficulties and to prevent the drift of adjacent teeth. Conventional solutions to this problem have included the fabrication of a provisional restoration using the adjacent teeth as abutments, removable temporary acrylic prostheses, and resin-bonded bridges (Daly, 1983; Ashley and Holden, 1998; Safirstein et al., 2001). Various treatment modalities are available for the replacement of lost anterior teeth, such as orthodontic closure of the edentulous space with fixed appliances, insertion of an osseointegrated dental implant, and the classical approach of a conventional fixed partial denture and removable prosthesis (Foitzik et al., 2007; Sangur et al., 2010). Each of these approaches has its own specific advantages and disadvantages in terms of usage, aesthetics, and compatibility.

A fixed, acid-etch bridge offers several advantages over removable appliances, including enhanced aesthetics, ease of use, and avoidance of having to become accustomed to a removable prosthesis (Fahl, 1998; Smidt, 2002; Chafaie and

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Portier, 2004). This approach would also permit the patient's natural crown to be used as a pontic for an immediate bridge (Belli and Ozer, 2000), with little or no need for complicated laboratory procedures. The use of the extracted natural crown as a pontic provides the advantage of having the right size, shape, texture, and colour. Moreover, the patient is comforted by the presence of his or her natural tooth. The use of a modified resin-bonded bridge with a natural-tooth pontic provides additional advantages of aesthetic maintenance, tooth conservation, cost effectiveness, and preservation of the lost tooth's gingival architecture.

This article describes the innovative technique of replacing an extracted tooth having severe resorption with a modified resin-bonded bridge utilizing the extracted natural tooth as a pontic.

Case report

A 24-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with a complaint of a mobile maxillary right central incisor. The medical history of the patient was not significant. Dental history revealed an episode of trauma in the maxillary anterior region 5 years ago. On clinical examination, the maxillary right central incisor showed grade III mobility, and the adjacent (left) central incisor was tender to percussion (Fig. 1a). The adjacent teeth were checked for vitality, and the maxillary left central incisor showed no response. For the right central incisor, radiographic examination revealed extensive root resorption and periradicular bone loss (Fig. 1b). X-rays also displayed widening of the periapical periodontal ligament of the left central incisor.

Both clinical and radiographic examinations indicated extraction of the maxillary right central incisor and endodontic treatment of the adjacent central incisor. Because of the high aesthetic demands of the patient, immediate bonding of the natural tooth pontic as a provisional restoration was performed. After its extraction, the immediately bonded natural tooth pontic protected the extraction socket and formed an ovate pontic contact surface. A modified resin-bonded fixed partial denture was placed, with the extracted maxillary right central incisor being used as a pontic.

Technique

- *Step 1:* After formulating the treatment plan, we extracted the maxillary right central incisor atraumatically under local anaesthesia. The crown was separated from the resorbed root by using a diamond disc (Fig. 1c). The apical opening of the pulp canal was cleaned, enlarged slightly, and sealed with composite resin. A modified ridge-lap pon-

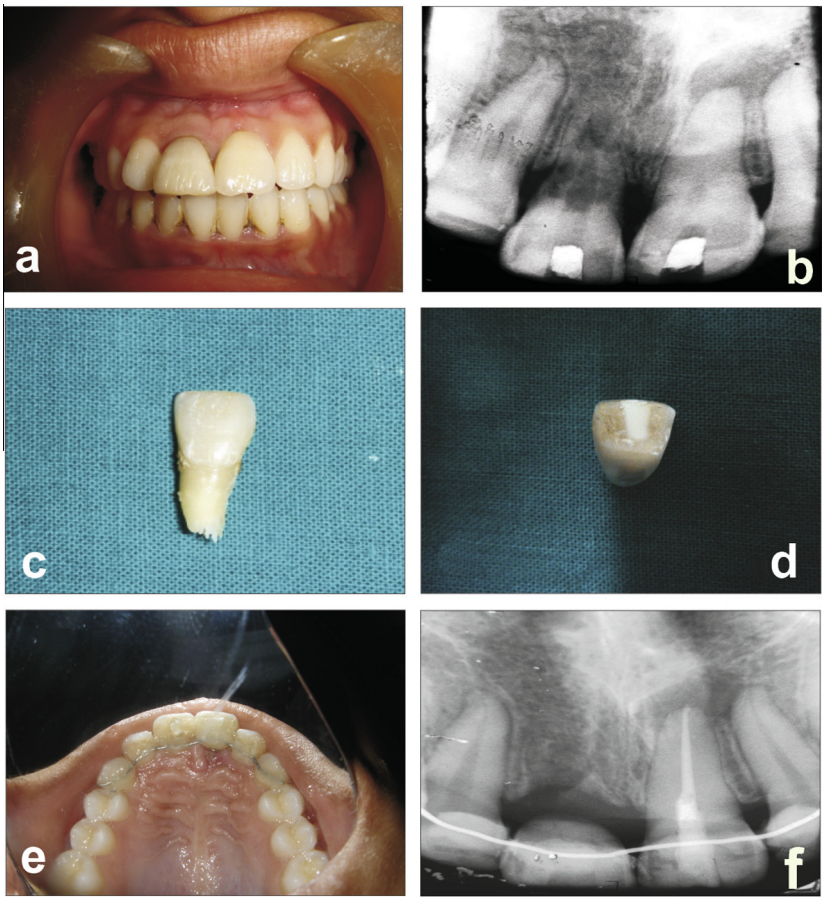

Figure 1 (a) Preoperative clinical view; (b) preoperative radiograph; (c) extracted maxillary right central incisor; (d) natural tooth pontic shaped; (e) provisional splinting of the natural tooth pontic; and (f) radiograph after splinting pontic to adjacent endodontically treated central incisor.

tic was designed for the cervical area to facilitate cleaning and to give an emergence profile to the natural tooth pontic (Fig. 1d). The pontic was stabilized in the extraction socket with a resin-wire splint as a provisional restoration, to maintain the gingival architecture for the final prosthesis while simultaneously meeting the high aesthetic demands of the patient (Fig. 1e). In the meantime, the adjacent central incisor was treated endodontically (Fig. 1f).

- *Step 2:* The patient was recalled after 1 month to assess the health of the soft tissues in the extraction socket and to remove the provisional splint (Fig. 2a). The pontic was cleaned with pumice, washed, and kept in normal saline solution until further use.

The low socioeconomic status and high aesthetic needs of the patient demanded that a resin-bonded bridge be fabricated by using the extracted tooth as a pontic. The adjacent teeth were prepared for use as abutments for the resin-bonded bridge, which involved a 0.5-mm lingual reduction of the enamel and a supragingival margin extending 1 mm to the centre of the interproximal contact, with a palatal finish line that was 2 mm gingival to the incisal edge for optimal aesthetics. For proper retention and path of insertion, adequate and parallel axial reduction of the proximal surface adjacent to the edentulous area, extending lingually to the planned interproximal contact, was required. Elastomeric impressions of the maxillary and mandibular arches were taken with an addition of silicon (Imprint II, 3M ESPE); the casts were prepared with dental stone.

- *Step 3:* The natural tooth pontic was stabilized by using light-cured acrylic resin on the maxillary cast (Fig. 2b) to maintain its proper alignment with the adjacent teeth. A retention lock was also prepared on the palatal aspect of the natural tooth pontic (4-mm high, 3.5-mm wide, and 2-mm deep; Fig. 2c). An indirect wax pattern (Renfert, Schuller Germany, Esslingen, Germany) was formed on the pre-

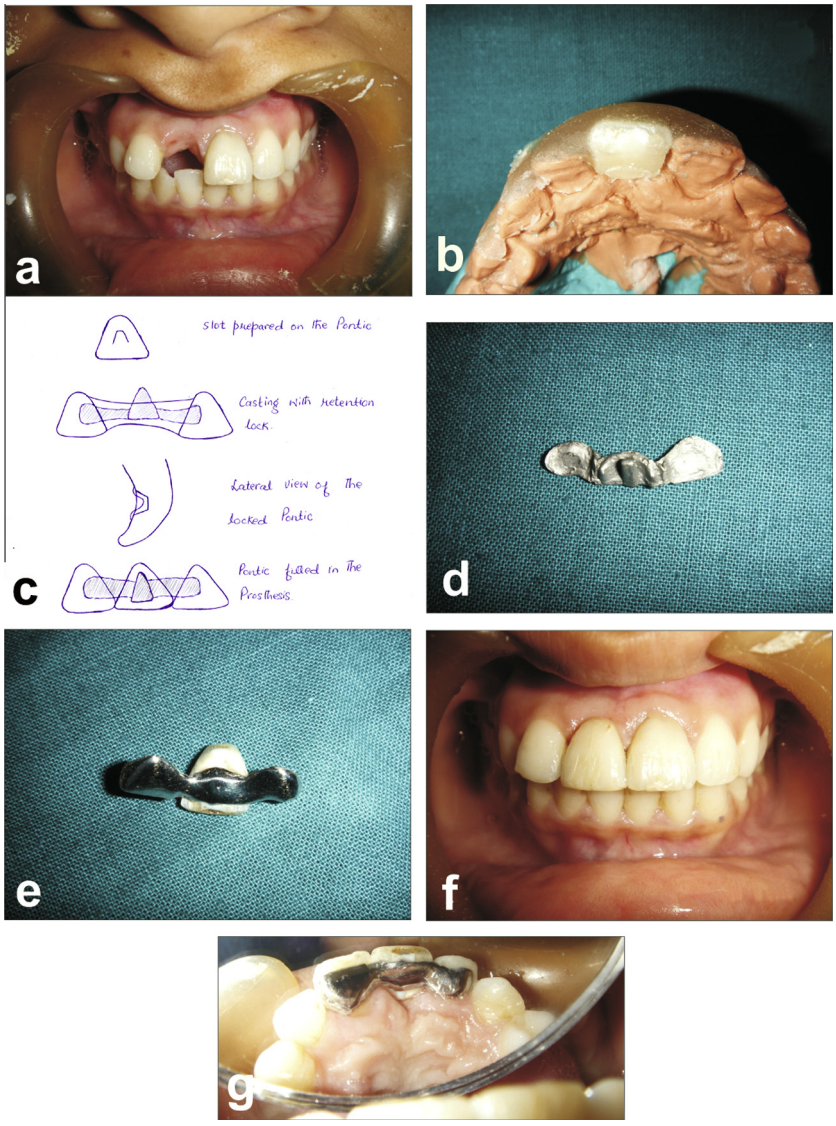

Figure 2 (a) Provisional splint removed; (b) natural tooth pontic stabilized on the cast (c) lock design and diameters; (d) casting made; (e) natural tooth pontic fit onto the casting; and (f and g) postoperative views after cementation of the final prosthesis.

pared teeth, and a Wiron 99 casting was made (Bego USA, Lincoln RI, USA; Fig. 2d). The pontic was removed from the cast and fitted into the retention lock of the casting (Fig. 2e). At the next appointment, the fitting of the fixed prosthesis, the occlusion was checked and the resin-bonded fixed partial denture with the natural tooth pontic was cemented onto the prepared abutment teeth by using dual-cure resin (RelyX, 3M ESPE; Fig. 2f and g).

Discussion

The present era of dentistry relies extensively on aesthetic principles because of increasing patient demands. A restorative dentist should try to meet these demands, while simultaneously considering the patient's socioeconomic status. Immediate replacement of lost anterior teeth prevents psychological and social trauma to the patient. A resin composite may be used to splint the pontic to sound neighbouring teeth as a provisional restoration until the final prosthesis is fabricated. One major advantage of retaining the patient's natural crown is that the patient can better tolerate the effect of tooth loss (Ashley and Holden, 1998).

In the present case, the patient wanted immediate aesthetic replacement at reduced treatment cost. A modified resin-bonded fixed bridge was fabricated by utilizing the patient's extracted natural tooth as a pontic. The natural tooth pontic was splinted immediately after extraction to the adjacent teeth, to preserve the gingival architecture of the extraction socket and to fulfil the aesthetic requirements of the patient until the final prosthesis was fabricated.

Ethical clearance

This work has been approved by the appropriate ethics committees related to our institution and that subjects gave informed consent to the work.

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